

Applicant: A. Smith, et al.
Application No.: Unassigned
Filing Date: Herewith
Docket No.: 903-194 PCT/US
Page 9

B. Amendments to the Claims:

Please amend the claims as follows:

Claim 1. (Currently amended): Method for the catalytic reduction of an amide for the preparation of an amine at a temperature of below 200°C and a pressure of below 50 bar, the catalyst being chosen from bimetallic and trimetallic catalysts of the group consisting of ABC, AB, AC and BC, wherein:

A is a metal, ~~chosen~~ selected from the group[[,]] consisting of Co, Fe, Ir, Pt, Rh and Ru,

B is a metal, ~~chosen~~ selected from the group[[,]] consisting of Cr, Mo, Re and V, and,

C is a metal, ~~chosen~~ selected from the group[[,]] consisting of Cu, In and Zn.

Claim 2. (Original): Method according to claim 1, wherein the catalyst is a heterogeneous catalyst on a support.

Claim 3. (Currently amended): Method according to claim 2, wherein the support is ~~chosen~~ selected from the group consisting of carbon, silica, titania, silica-alumina or [[a]] combinations thereof.

Claim 4. (Currently amended): Method according to ~~any of the preceding claims~~ claim 1, wherein the pressure is 30 bar or less, preferably 15 bar or less.

Claim 5. (Original): Method according to claim 4, wherein the pressure is between 1-17 bar, preferably between 5-10 bar, most preferably between 6-10 bar.

Claim 6. (Currently amended): Method according to ~~any of the preceding claims~~ claim 1, wherein the reduction is performed in continuous flow mode, preferably in a gaseous phase.

Applicant: A. Smith, et al.
Application No.: Unassigned
Filing Date: Herewith
Docket No.: 903-194 PCT/US
Page 10

Claim 7. (Currently amended): Method according to ~~any of the preceding claims~~ claim 1, wherein the temperature is 160° or less.

Claim 8. (Original): Method according to claim 7, wherein the temperature is 130°C or less.

Claim 9. (Original): Method according to claim 8, wherein the temperature is between 70°C-100°C, preferably around 80°C.

Claim 10. (Currently amended): Method according to ~~any of the claims 1-5~~ claim 1, wherein the reduction is performed in batch mode, preferably in liquid phase.

Claim 11. (Original): Method according to claim 10, wherein the amide is dissolved in a Bronsted-acid.

Claim 12. (Currently amended): Method according to claim 11, wherein the Bronsted-acid is an organic acid.

Claim 13. (Original): Method according to claim 12, wherein the organic acid is a carboxylic acid.

Claim 14. (Original): Method according to claim 13, wherein the carboxylic acid comprises acetic acid.

Claim 15. (Currently amended): Method according to ~~any of the claims 11-14~~ claim 11, wherein the Bronsted-acid having has a pKa value of 5 or less, preferably between 3 and 5.

Applicant: A. Smith, et al.
Application No.: Unassigned
Filing Date: Herewith
Docket No.: 903-194 PCT/US
Page 11

Claim 16. (Currently amended): Method according to ~~any of the preceding claims~~ claim 11, wherein the concentration of the Bronsted-acid being 1.0 M or less, preferably between 0.2 and 0.8 M, more preferably between 0.4 and 0.5 M.

Claim 17. (Currently amended): Method according to ~~any of the claims 10-16~~ claim 10, wherein the liquid phase comprising an additive comprising a Lewis acid.

Claim 18. (Original): Method according to claim 17, wherein the Lewis acid comprises a Boron compound.

Claim 19. (Currently amended): Method according to claim 17 ~~or 18~~, wherein the ratio amide:additive is 4 or less, preferably 2 or less, most preferably between 0.9 and 1.1.

Claim 20. (Currently amended): Method according to ~~any of the claims 10-19~~ claim 10, wherein the temperature is between 90-140°C, preferably 100-130°C.

Claim 21. (Currently amended): Method according to ~~any of the preceding claims~~ claim 1, wherein the catalyst is ~~chosen~~ selected from the group[[,]] consisting of[[:]] CoCu, FeIn, FeRe, IrMo, IrRe, IrV, MoIn, PtMo, PtRe, PtV, ReIn, RhCu, RhIn, RhM, RhRe, RhV, RuRe, CoMoZn, CoReCu, CoReIn, CoVIn, FeCrIn, FeReCu, FeReIn, FeReZn, IrMoCu, IrReCu, IrReZn, IrVZn, PtMoCu, PtMoIn, PtMoZn, PtReCu, PtReIn, PtReZn, PtVIn, PtVZn, RhMoCu, RhMoIn, RhMoZn, RhReCu, RhReIn, RhReZn, RhMoZn, RhVIn, RuReCu, RuReZn and combinations thereof.

Claim 22. (Currently amended): Method according to claim 21, wherein the catalyst is ~~chosen~~ selected from the group[[,]] consisting of IrMo, IrRe, PtRe, PtV, RhRe, RhV, FeReIn, PtReCu, PtReIn, PtReZn, RhMoCu, RuReZn, PtMo, RhMo, RuRe, IrReZn, and PtMoCu and combinations thereof.

Applicant: A. Smith, et al.
Application No.: Unassigned
Filing Date: Herewith
Docket No.: 903-194 PCT/US
Page 12

Claim 23. (Currently amended): Method according to claim 22, wherein the catalyst is ~~chosen~~ selected from the group[[,]] consisting of IrReZn, PtReCu, PtReIn, FeReIn, PtMo, PtV, RhMo, PtMoCu, RhMoCu, PtRe, ~~and~~ RuRe and combinations thereof.

Claim 24. (Currently amended): Method according to claim 23, wherein the catalyst is ~~chosen~~ selected from the group[[,]] consisting of PtReCu, PtRe, PtMo IrReZn, PtMoCu, ~~and~~ PtReIn and combinations thereof.

Claim 25. (Currently amended): Bi- or trimetallic catalysts for the reduction of amides to amines, ~~chosen~~ wherein the catalysts are selected from the group[[,]] consisting of [[:]] CoCu, FeIn, FeRe, IrMo, IrRe, IrV, MoIn, PtMo, PtRe, PtV, ReIn, RhCu, RhIn, RhV, CoMoZn, CoReCu, CoReIn, CoVIn, FeCrIn, FeReCu, FeReIn, FeReZn, IrMoCu, IrReCu, IrReZn, IrVZn, PtMoCu, PtMoIn, PtMoZn, PtReCu, PtReIn, PtReZn, PtVIn, PtVZn, RhMoCu, RhMoIn, RhMoZn, RhReCu, RhReIn, RhReZn, RhMoZn, RhVIn, RuReCu, RuReZn and combinations thereof.

Claim 26. (Currently amended): Bi- or trimetallic catalyst according to claim 25, wherein the catalyst ~~being chosen~~ is selected from the group[[,]] consisting of IrMo, IrRe, PtRe, PtV, RhV, FeReIn, PtReCu, PtReIn, PtReZn, RhMoCu, RuReZn, PtMo, IrReZn, ~~and~~ PtMoCu and combinations thereof.

Claim 27. (Currently amended): Catalyst according to claim 26, wherein the catalyst is selected ~~chosen~~ from the group[[,]] consisting of PtReCu, PtRe, PtMo IrReZn, PtMoCu, ~~and~~ PtReIn and combinations thereof.

Applicant: A. Smith, et al.
Application No.: Unassigned
Filing Date: Herewith
Docket No.: 903-194 PCT/US
Page 13

Claim 28. (Currently amended): Method for the selection of at least one bi- or trimetallic catalyst, active in the reduction of amides into amines, from a collection of bi- and/or trimetallic catalysts, comprising the steps of:

- A) preparing the catalysts on separate carriers,
- B) loading the catalysts prepared in step A) in separate reactor vessels, the vessels having a parallel arrangement,
- C) feeding and incubating the reactor vessels with an amide and hydrogen at identical conditions regarding at least one of the quantities, chosen from reaction time, temperature and pressure,
- D) measuring the conversion of amides into amines in each reactor vessel, and
- E) selecting one or more of the catalysts, based on the measured conversion in step D).

Claim 29. (Original): Method according to claim 28, wherein in step C) the reaction time, temperature and pressure in the reactor vessel are similar for each reactor vessel.

Claim 30. (Currently amended): Method according to ~~any of the claims 28-29~~ claim 28, wherein in step A) the catalysts are prepared on separate carriers in parallel.

Claim 31. (Currently amended): Method according to ~~any of the claims 28-30~~ claim 28, wherein in step C) the reaction vessels are fed in parallel.